

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E21B10/56 E21B29/06

According to International Patent Classification (IPC) or to both national classification and IPC

28 APR 2005

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 979 571 A (NAZZAL GREG ET AL) 9 November 1999 (1999-11-09) claim 1; figure 10	1-6
Y	WO 00 36264 A (BEX PHILLIP ALEXANDER ; TANK KLAUS (ZA); DE BEERS IND DIAMOND (ZA)) 22 June 2000 (2000-06-22) page 3, line 12 - line 15; figure 12	1-6
A	US 6 187 068 B1 (FRUSHOUR ROBERT H ET AL) 13 February 2001 (2001-02-13) See abstract figures 9-11	1
A	US 2002/074168 A1 (GRIFFIN NIGEL DENNIS ET AL) 20 June 2002 (2002-06-20) See abstract figures 11B, 22B	1

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

16 December 2003

Date of mailing of the international search report

23/12/2003

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 361 936 A (SMITH INTERNAT INC) 7 November 2001 (2001-11-07) See asbtract figures 7-12	1

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5979571	A	09-11-1999	AU 731033 B2	22-03-2001
			AU 4593297 A	17-04-1998
			CA 2238628 A1	02-04-1998
			GB 2323112 A , B	16-09-1998
			NO 982372 A	24-07-1998
			WO 9813572 A1	02-04-1998
WO 0036264	A	22-06-2000	AU 1579400 A	03-07-2000
			WO 0036264 A1	22-06-2000
US 6187068	B1	13-02-2001	NONE	
US 2002074168	A1	20-06-2002	AU 7423001 A	02-04-2002
			AU 8604901 A	02-04-2002
			CA 2423099 A1	28-03-2002
			CA 2423102 A1	28-03-2002
			EP 1190999 A2	27-03-2002
			EP 1191000 A2	27-03-2002
			EP 1191001 A2	27-03-2002
			EP 1190791 A2	27-03-2002
			EP 1324960 A1	09-07-2003
			EP 1318969 A1	18-06-2003
			WO 0224603 A1	28-03-2002
			WO 0224601 A1	28-03-2002
			NO 20031253 A	19-05-2003
			NO 20031254 A	19-05-2003
			US 2003021995 A1	30-01-2003
			US 2003034182 A1	20-02-2003
			US 2003035957 A1	20-02-2003
			US 2003037640 A1	27-02-2003
			US 2003035958 A1	20-02-2003
			US 2002034632 A1	21-03-2002
			US 2002034631 A1	21-03-2002
			US 2002033383 A1	21-03-2002
			US 2002033077 A1	21-03-2002
			US 2002033282 A1	21-03-2002
			US 2002045059 A1	18-04-2002
			ZA 200107478 A	12-03-2002
			ZA 200107479 A	12-03-2002
			CA 2379806 A1	02-10-2002
			EP 1247787 A1	09-10-2002
			NO 20021290 A	03-10-2002
			US 2002139584 A1	03-10-2002
GB 2361936	A	07-11-2001	US 6361873 B1	26-03-2002
			CA 2332603 A1	08-08-2001